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ABSTRACT

In an effort to reevaluate employment preparation in community college curricula, a review of recent research was conducted to identify the most valued skills in today's workforce. Among the abilities desired by today's employers are: (1) knowing how to learn; (2) competence in reading, writing, and computation; (3) effective listening and oral communication skills; (4) adaptability through creative thinking and problem solving; (5) personal management with strong self esteem and initiative; (6) interpersonal skills; and (7) leadership effectiveness. This comprehensive skill set, once required only of managers but now applying to all levels of employment, appeared in several employer surveys, with an additional emphasis on communication and computer/technical skills. (YKH)

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Workforce Skills Needed by Today's Employers

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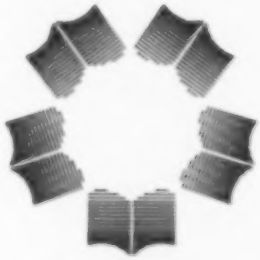

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PRINCE GEORGE'S COMMUNITY COLLEGE
Office of Institutional Research and Analysis

WORKFORCE SKILLS NEEDED BY TODAY'S EMPLOYERS

Market Analysis MA98-5
November 1997

Introduction

Workforce training is a major mission of community colleges. The Board of Trustees adopted the following economic development strategic initiative for FY99:

> Expand workforce training and retraining through partnerships with the corporate community in order to meet the identified economic development needs of employers and employees in Prince George's County.
>
> Economic development is the effort undertaken to support the retention, expansion, and creation of jobs in Prince George's County and to contribute to the development and maintenance of a skilled workforce of existing and prospective employees.

To assist the college in addressing this strategic initiative, the Office of Institutional Research and Analysis prepared this literature review of recent research into workforce needs. What skills do employers need and expect of their employees?

Workplace Basics: The Skills Employers Want

In the mid-1980s, the American Society for Training and Development and the U.S. Department of Labor conducted joint research into the skills needed by America's workforce (Carnevale, Gainer, and Meltzer, 1988). They found a division in the workforce that suggested an important role for community colleges:

> In a comparison among countries, the more educated and trained half of the American workforce competes well with the white-collar and technical elites of its economic rivals. But the other half of the workforce is not as well prepared, and this is where the U.S. is losing the competitive race. This fact presents a major challenge for American educators and employers. Academic and employer institutions must stop catering to the development and use of white-collar and technical elites. Instead, they must choose a more broad-based mission that is attentive to the non-college bound and the nonsupervisory employee.

Largely as a result of technological advancements, manufacturing and point-of-service employees are increasingly important to business success or failure:

> New technologies are redefining basic skill requirements. By decentralizing the production of products and services, information-based technologies are increasing the autonomy and value of employees at the point of production and service delivery. At all organizational levels, the roles of personnel have expanded and they are now responsible for a wider range of products and for the customization of an array of products for individual customers. With these broader roles comes greater opportunity to have a positive or negative effect on efficiency, quality, and innovation.

Given these circumstances, the skills of workers at all levels are a critical organizational resource. But worker skills are equally important to the worker:

> A workforce with sound basic skills will strengthen its employer's ability to compete. And for the individual worker, basic skills are the keys to greater opportunity and a better quality of life. Workers with good basic skills find it easier to acquire more sophisticated skills that leverage better jobs and higher pay.

What are the workplace skills employers want? The authors summarized their research into employer needs in a hierarchy of seven skill groups:

- **The Foundation: Learning to Learn.** This is the most basic of all skills and is the key to future success. Equipped with the skill of knowing how to learn, an individual can achieve competency in the other workplace skills that add value to the organization and enable personal growth and career development. Global competition and technological advancements will require perpetual learning throughout a career.

- **Competence: Reading, Writing, and Computation.** The basic academic skills of reading, writing, and computation have long been revered as the keys to success, but in reality in the past many workers could succeed because of "a strong back and willing hands." But today, a strong work ethic will not overcome illiteracy or innumeracy. Workers at all levels must have the basic academic skills to function adequately in today's computerized and decentralized work environment.

- **Communication: Listening and Oral Communication.** It is through listening and speaking that people interact most frequently; effective communication is central to the successful operation of a competitive venture. Communications skills are second only to job knowledge in

promoting workplace success. While public speaking may be included in some academic curricula, typically no formal training in listening is offered.

- **Adaptability: Creative Thinking and Problem Solving.** The ability to recognize and define problems, invent and implement solutions, and track and evaluate results is a key personal and organization skill. Breaking out of the box of narrow linear thinking and seeing connections among seemingly unrelated ideas promote the innovation and adaptability needed for organizational success.

- **Personal Management: Self-esteem, Goal-setting/Motivation, and Personal and Career Development.** Employees with strong self-images take pride in their work and feel comfortable setting and striving for ambitious goals. As they contribute to organizational success, they build strong personal career histories and expand their personal horizons.

- **Group Effectiveness: Interpersonal Skills, Negotiation, and Teamwork.** The use of teams in the workplace has been linked to higher productivity, product quality, and quality of worklife. But teamwork requires strong interpersonal skills and the ability to negotiate, diffuse conflict, and understand others.

- **Influence: Organizational Effectiveness and Leadership.** To successfully compete, employers need employees who understand their organization's purpose and goals, who assume responsibility willingly, and who can motivate coworkers to exemplary performance. Once thought of as skills only needed by the managerial elite, these leadership skills are now basic skills needed throughout an organization.

Acknowledging the comprehensiveness of these workplace essentials, the authors concluded that "one might even say that a new kind of American worker is being ordered up. And this new worker will be expected to have a broad set of skills that were previously required only of supervisors and management."

Maryland Business Research Partnership Workforce Survey

The Maryland Business Roundtable for Education, the Maryland Department of Business and Economic Development, the Maryland Economic Development Commission, and the Maryland State Department of Education contracted with the University of Baltimore's Maryland Business Research Partnership in 1997 to conduct two surveys of Maryland business leaders' perceptions of labor market conditions. Together, a phone survey of 300 human resource managers and nearly 700 returned

questionnaires from a mail survey provided a current report on the views of Maryland employers on workforce issues. The surveys found that manufacturing and high technology workers were in short supply, that technical skills were in strong demand, that worker shortages were negatively impacting Maryland businesses, and that over two-thirds of the employers provided in-house training to upgrade employee skills and productivity. What were the greatest training needs? In addition to technical skills, employers reported that employees needed training in interpersonal communications and teamwork, individual responsibility and work habits, basic academic skills, and life skills such as time management, punctuality, and courtesy.

Employee Training Goals MBRP Survey of Maryland Employers, 1997
Cited by over 90 percent of Maryland employers:
Improve productivity
Improve technical skills
Improve interpersonal skills, promote teamwork, responsibility
Assure success over competition
Improve employee attitudes and work habits
Promote employee personal and career development
Cited by 80 to 90 percent of Maryland employers:
Introduce new technology requiring new skills
Improve basic skills in reading, communication, and calculation
Improve life skills, attendance, punctuality, courtesy

Maryland Community College Workforce Training Survey

In the spring of 1995, the Maryland Association of Deans and Directors of Continuing Education/Community Services conducted a mail survey of all businesses and organizations that had received workforce training under a contract arrangement with a Maryland community college during 1993-94 (Clagett, 1995). A total of 561 questionnaires were returned from an initial mailing of 1,021. In addition to evaluating the workforce training provided by Maryland community colleges, the survey asked respondents to identify their current and future employee training needs. The greatest need was for technical training in computer applications, with half the respondents stating that they had substantial need for this kind of training.

Anticipated Employee Training Needs, 1995 Maryland Community College Workforce Training Survey Respondents					
Type of Training	N	No Need (Rated 1)	Some Need (Rated 2-3)	Substantial Need (4-5)	Scale Mean
Computer applications	545	17%	33%	50%	3.33
Interpersonal relations	542	22%	35%	44%	3.09
Written/oral communications	545	24%	44%	32%	2.80
Customer service training	547	36%	34%	29%	2.56
Telecommunications/ networking	541	36%	43%	21%	2.39
Modern office technologies	544	40%	45%	16%	2.24
Basic skills (reading, math)	546	58%	27%	15%	1.97
Manufacturing/ industrial job skills	537	72%	13%	14%	1.69
Languages (foreign, English as 2nd Lang.)	540	78%	18%	4%	1.39

Second only to computer training was the need for employee improvement in interpersonal relations and team building, with 44 percent of the respondents indicating classes in these topics were substantially needed (rated 4 or 5 on a five-point scale). A third of the respondents gave employee written and oral communications a similar rating of need. Other training areas cited as needed, at least to some degree, by a majority of the respondents included customer service training, telecommunications and networking, and modern office technologies.

National Community College Workforce Training Study

A national workforce training study sponsored by the National Council for Continuing Education and Training, the National Council for Occupational Education, and COMBASE, and summarized in a 1997 publication of the Community College

Press (Tony Zeiss and Associates, 1997), presented a favorable portrait of community college workforce training. The tone was set in the foreword by Anthony Carnevale and Donna Desrochers of the Educational Testing Service:

> Community colleges are gradually emerging as the prototypical learning institutions for the new economy. They equip graduates with a mix of applied and academic learning that is increasingly necessary to sustain careers in modern economies. Graduates receive occupational preparation that allows access to jobs that general education, all by itself, no longer guarantees. As a result, the earnings of community college graduates who work in managerial, professional, and technical occupations are higher, on average, than the earnings of four-year college graduates with no particular occupational preparation. At the same time, community college preparation is superior to job-specific training, on and off the job. Community college curricula provide general education and broadly-based occupational learning which add longevity and transferability to a graduate's skills that more specific job training, all by itself, does not provide.

David Pierce, president of the American Association of Community Colleges, added in the report's preface:

> A common goal for education and business has emerged. Educating and training America's workers has become paramount to our economy, our standard of living, and our influence in the world theaters of trade, politics, and human development. It is gratifying to see that this country's community colleges are leading the way in workforce development.

A total of 104 community colleges participated, in varying degrees, to the study. The specific workforce skill needs identified by study participants were, in order of need as expressed by the employers surveyed:

- **professional development skills**: supervision, total quality management, and time management;
- **computer skills**: word processing, spreadsheets, database, and programming;
- **interpersonal skills**: interacting with others and working in teams;
- **critical thinking skills**: problem solving, creativity, and learning how to learn;

- **communications skills**: reading, mathematics, listening, and speaking;
- **business skills**: business writing, marketing, and customer service;
- **government relations skills**: knowledge of governmental regulations pertinent to job;
- **personal life skills**: responsibility, self-esteem, integrity, and honesty;
- **technical skills**: advanced, job-specific knowledge and skills; and
- **computational skills**: basic mathematics, charts, and graphs.

As this ranking suggests, today's employers expect a lot of their workers. As Zeiss put it in the study's overview:

> Never before have workers been faced with the need to acquire such a comprehensive range of skills in order to meet and overcome the challenge of global competition. Never before have American employers faced such a need to keep the skill levels of their workers so high in order to compete. This transformation reaches from the boardroom to the shop floor. In fact, frontline workers are now expected to have essentially the same broad set of skills previously required only of supervisors and managers.

Surveys of Employers of PGCC Graduates

Every other year, as part of a statewide graduate follow-up survey, the college's research office mails questionnaires to employers of PGCC graduates. The employer questionnaire, in addition to rating scales for a number of graduate job attributes, includes an open-ended question inviting employers to suggest the skills or areas of knowledge a community college graduate should have. While this question often prompts very job-specific answers, many employers have emphasized basic skills such as oral and written communications, interpersonal and team-building skills, and computer literacy.

PGCC Technology Task Force

In March 1997, the college's Science and Technology Resource Center (STRC) hosted a "Technology Task Force" meeting to solicit the opinions of leaders of local technology firms concerning the technological skill needs of their employees. Thirty-eight participants advised the college about the skills the college's science,

engineering, and technology students should have. There was agreement that *all* students needed training in word processing, databases, spreadsheets, graphics packages, and presentation software. Students need to be able to pull data off the Internet, to research topics using the Internet, to communicate electronically, and to load their own software. Task Force participants were unanimous in asserting that technical graduates nèeded better oral and written communications skills:

> All participants shared the opinion that employees need stronger communication skills. Participants suggested that students should be given tasks while in school that include development and delivery of presentations and development of full writing samples as well as bullet-type outlines. Participants also noted that since proposal development is such a significant component of many jobs, students should get experience in developing a logical presentation to "sell" an idea or project, managing a course project, and problem solving within a contextual framework.

The employers indicated that technology will continually change and thus lifelong learning is a given. They urged that the college teach the most up-to-date languages and software, that faculty participate in private sector internships to remain current with the market, that cooperative education be available to students, and that the college make its retraining capabilities better known to the business community.

Testimony before the PGCC Board of Trustees

At its October 9, 1997 meeting, the Board of Trustees of Prince George's Community College heard testimony concerning technology, one of its five strategic priorities. Dr. Gilbert Levin, president of Biospherics, Inc. and chair of the college's Technology Task Force, provided the employer's perspective on technology needs. His initial comments to the Board emphasized the most fundamental technologies:

> There are two high technologies that we always look for in prospective hires. These technologies are the highest technologies yet achieved by the human race. They are what sets humans apart from all other forms of life, and to the extent to which they are mastered, they determine the professional fates of all professional business people. They are communications--speaking--and storage of information--writing or word processing. I cannot tell you enough how important these skills are.
>
> We get many people coming in who cannot write or speak properly. A large part of our business is talking to people through phones. We just have to get people who are trained in utilizing the English language to make things clear. I am talking about the proper use of the language so

there is no confusion when a statement is made. And, of course, recording and writing these things are very important. I cannot tell you how many professional engineers we have hired and discovered they could not write a report. These two requirements apply to technical and general business applicants alike. I really hope that whatever you do in the way of high technology and improving technology here, you always consider these two highest technologies and make sure that they are taught properly.

Dr. Levin went on to discuss specific technical skills PGCC graduates should possess. He urged that *all* students, not just those in technical fields, should master the following:

- keyboarding and mouse;
- Windows 95;
- word processing;
- spreadsheets; and
- accessing and navigating the Internet.

Students in technical fields need, in addition to the basics listed above, training in the following areas:

- database operations;
- flat and relational databases;
- searching routines, including SQL and QBE;
- software and hardware troubleshooting; and
- networks and network troubleshooting.

New Jersey's "Mecomtronics" Associate Degree Program

The New Jersey Center for Advanced Technological Education (NJCATE) is a partnership of academic institutions, private industry, government agencies, and professional associations committed to reforming the education of engineering technicians to meet the needs of the 21st Century. Partly funded by the National Science Foundation, and based on a consortium organized by Middlesex County

College in Edison, New Jersey, the NJCATE solicited the views of business and industry leaders through a comprehensive survey and a two-day conference held in November, 1996. A resulting report issued in May 1997 summarized the need for multi-functional, multi-skilled technicians:

> Technology is changing the workplace, and the American workforce must change with it. No longer do technicians work independently, with only cursory connections to the rest of the company or corporation. Employers are looking for more quality-minded and customer-oriented employees who can accomplish multiple tasks while working with self-managed work teams. This new workplace is also characterized by rapid telecommunications, sophisticated information systems, and advanced technological mechanisms, which require a new technician who has a thorough understanding of the mechanics, electronics, computer hardware and telecommunications software that drive the technology.

Noting that in today's industry the definitive lines of specialized engineering technologies are disappearing, the NJCATE is promoting an innovative "Mecomtronics Engineering Technology" curriculum for educating multi-functional, "robust technicians" skilled in mechanics, computers, telecommunications, and electronics. With support from the Advanced Technological Education Program of the National Science Foundation, NJCATE is developing a curriculum designed to:

- emphasize a broad technical education with strong grounding in the fundamentals of mathematics and the physical science and engineering technologies;

- incorporate instructional activities that require the use of scientific processes to arrive at solutions to problems;

- center on the technical competencies linked with the core mathematics and science competencies that support the development of technical knowledge;

- present instructional activities within the context of industry-based projects;

- integrate instructional activities to develop oral and written communications skills;

- provide a framework for learning to work as a team member and as an individual;

- incorporate case studies related to the content that elucidate ethical and social issues that are relevant to the development of a technician;

- provide the flexibility to incorporate new projects as technology changes;

- incorporate authentic assessment of student learning;

- use concurrent, just-in-time educational delivery;

- develop an infrastructure to support self-paced learning via evolving broadband telecommunications technologies;

- incorporate computer-aided instruction as rapidly and as fully practicable in academic programs; and

- offer cooperative education and apprenticeship programs which expose students to an understanding of the international, product-oriented climate.

The curriculum will be designed to produce technicians with an:

- understanding of fundamental science, technology, and engineering;

- appreciation of problem solving, production processes, and systems;

- ability to deal with a wide range of generalists in diverse businesses and cultures;

- ability and desire to continue learning throughout life;

- ability to formulate and express ideas in written and oral form; and

- ability to interact with others in both professional and social settings.

Welfare-to-work Program Needs

Community colleges across the country are helping meet the challenge of moving individuals from welfare to work. Welfare reform initiatives and consolidation of job-training and job-placement agencies provide opportunities for community colleges to develop short-term training programs to prepare completers for immediate entry-level employment as well as pathways to career-ladder options leading to better wages through additional study. In North Carolina, joint research conducted in 1997

by the Charlotte Chamber of Commerce, the University of North Carolina at Charlotte, and Central Piedmont Community College found that employers wanted employees with good work ethics, solid basic skills, a positive work attitude, some work experience, content competencies, and appropriate technical application skills. The employers cared little about classroom grades, seat time, and academic credentials. Employers stressed the need for workplace readiness, defined in terms of workplace values, etiquette, teamwork, interpersonal skills, time management, ethics, conflict resolution, and adaptability. Report authors (Villadsen and Gennett, 1997) offered this advice to their community college colleagues:

> The stakes are high. Welfare reform and other emerging federal and state workforce consolidation legislation point to new imperatives for community colleges wishing to protect our historical role as premier providers of postsecondary job training. Failure to respond by adapting our training methods will leave the field to more entrepreneurial training providers.
>
> Perhaps even more important, new training mandates call us to question and enlarge our traditional missions of providing transfer education and career programs based on college credit. The university approach of measuring education based on seat-time, grades, and degrees is obviously not the flexible one needed for the emerging sponsored students and many other down-sized, entrepreneurial, or transitioning student/workers.

Knowledge Workers in the Information Age

In *Transforming Higher Education: A Vision for Learning in the 21st Century* (1997), Michael Dolence and Donald Norris state the following thesis:

> Society is undergoing a fundamental transformation from the Industrial Age to the Information Age. This is a global phenomenon with very significant local implications. All people, organizations, societies, and nations are affected, although not at the same pace or to the same degree. Those who realign their practices most effectively to Information Age standards will reap substantial benefits. Those who do not will be replaced or diminished by more nimble competitors.
>
> This societal transformation has direct implication for workers:
>
> Just to keep even each individual in the workforce will need to accumulate learning equivalent to that currently associated with 30 credit hours of instruction, every seven years. This level of learning will

be needed for every member of the Information Age workforce who wishes to remain competitive and productive--perhaps even to maintain basic employment.

This learning will increasingly take place over intranets and the Internet. Indeed, Dolence and Norris assert that "the network is the fundamental organizational principle of 21st century enterprises" and that "the information infrastructure will emerge as a primary delivery mechanism for educational materials." Thus workers will need to develop the skills to access and navigate networks:

> Learners need to develop the capacity to search, select, and synthesize vast amounts of information to create knowledge. Given the time cycle for information change, this synthesis must be a continuous process. This skill set is critical to success in Information Age organizations.
>
> Information Age learners need to be genuine "knowledge navigators" who develop the capacity to negotiate a pathway through an overwhelming universe of information on their way to understanding.

In sum, today's employers need individuals who can learn, apply information and knowledge, deal with uncertainty, and solve problems. These knowledge workers will not take time out for training, but will rather learn continuously. Dolence and Norris characterize this as *perpetual learning* or the *fusion of work and learning*:

> Perpetual learning is an apt metaphor for the opportunities created by the fusion of work and learning for knowledge workers. Such learning can occur every day, as part of knowledge workers' individual responsibilities and as part of their work within teams.

PGCC's General Education Requirements

How well do PGCC's general education requirements accord with the skill needs identified by employers? Most of the desired workforce competencies are addressed in the college's general education goals, as stated in the college catalog:

> The college's general education requirements are designed to provide each graduate with the skills and knowledge necessary to communicate effectively in oral and written English; read with comprehension; reason abstractly and think critically; understand and interpret numerical data; understand the scientific method; recognize and appreciate cultural diversity; and understand the nature and value of the fine and performing arts.

In addition, although not included in the college's statement of general education goals quoted above, the college requires all associate's degree candidates to demonstrate computer literacy by passing its Computer Literacy course (CIS 101) or completing a curriculum incorporating extensive computer use. CIS 101 includes, in addition to an overview of computers and their use throughout society, hands-on experience with microcomputers for word processing, spreadsheets, and accessing the Internet and World Wide Web.

Conclusion

Despite the continuing rapid advance of technology and expansion of knowledge as the Information Age evolves, employers are nearly unanimous in emphasizing the fundamental skills they need and expect of their workers. Foremost among these are oral and written communications skills. Even employers of technical workers in high technology industries assert the need for improved communications skills among their employees. Also essential are interpersonal skills, the ability to work in teams, goal- and priority-setting skills, problem-solving skills, and basic computer skills such as word processing, spreadsheets, and accessing the Internet.

Global competition and ever-changing technology make perpetual learning a career necessity. Thus *knowing how to learn* and having a personal commitment to continuous learning will be required for career advancement if not basic job security.

Identifying the skills employers want and need is only the first step in an analysis of the workforce preparation mission of community colleges. PGCC's general education requirements seem to address most of the basic skills concerns of employers. A full evaluation of the college's success in its workforce development mission would have to include answering at least two additional questions:

1. Are the skills enumerated in the college's statement of general education requirements being adequately covered in the courses identified as general education courses?

2. Do students possess the identified general education skills after completing the required general education courses?

Of course, evaluation of individual curricula would move beyond an assessment of basic, general education skills to include job- and career-specific areas of knowledge and skills. And an assessment of the college's total contribution to county workforce development would require analysis of occupational demand information. Beyond the basic skills discussed in this report, employers need applicants prepared for specific jobs. Comparisons of the occupational needs of local employers with the credit and noncredit program offerings of the college would be an appropriate next step.

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